Learning Works Charter School

Geometry A
Module 5

Student Name: _____ Teacher Name: _____

As you work through the chapters in your Geometry course, you will be encouraged to think and to make conjectures while you persevere through challenging problems and exercises. You will make errors – and that's okay! Learning and understanding occur when you make errors and push through mental roadblocks to comprehend and solve new and challenging problems.

Text: *Geometry Common Core*, Big Ideas, 2015

To ensure you are learning, you must show your work for all exercises.
YOU WILL NOT EARN CREDIT FOR ANSWERS WITHOUT WORK.

Chapter 6: Relationships Within Triangles (6.1-6.6)

_____ Maintaining Mathematical Proficiency (page 299): Complete exercises #1-8 **all**

_____ 6.1 Perpendicular and Angle Bisectors: Read the lesson and complete exercises #3-7 **all**, 11, 12, 14, 15, 17, 23, 39-44 **all**

_____ 6.2 Bisectors of Triangles: Read the lesson and complete exercises #3, 4, 5, 6, 7, 11, 12, 13, 15, 25, 39, 52, 53, 56, 57

_____ 6.3 Medians and Altitudes of Triangles: Read the lesson and complete exercises #1, 3-9 **all**, 11, 12, 13, 15, 17, 19, 20, 27, 55, 56

_____ 6.4 The Triangle Midsegment Theorem: Read the lesson and complete exercises #1, 3, 4, 5, 7, 8-16 **all**, 20, 21, 25

_____ 6.5 Indirect Proof and Inequalities in One Triangle: Read the lesson and complete exercises #2, 3, 4, 5, 7, 11-17 **all**, 19, 21, 22, 30

_____ 6.6 Inequalities in Two Triangles: Read the lesson and complete exercises #3-10 **all**, 15, 16, 25, 26, 27, 28

Students must complete the Chapter Review and Project with a teacher or tutor at school.

_____ Chapter Review (pages 350-352): Complete exercises #1-18 **all**

_____ Complete the attached Project **(No project = No credit)**

A teacher or tutor reviewed the Chapter Review and Project with the student.

Date: _____ Signature: _____

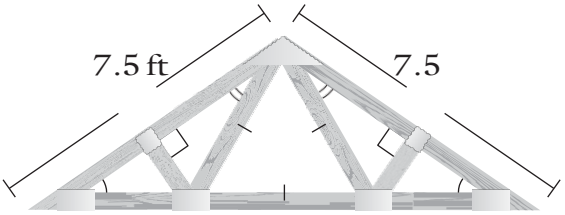
Grade

Continued on next page

Geometry Project
Module 5: Relationships Within Triangles
Textbook Pages 299-354

Building a Roof Truss

The simple roof truss is also called a planar truss because all of its components lie in a two-dimensional plane. How can this structure be extended to three-dimensional space? What applications would this type of structure be used for? Let's investigate!



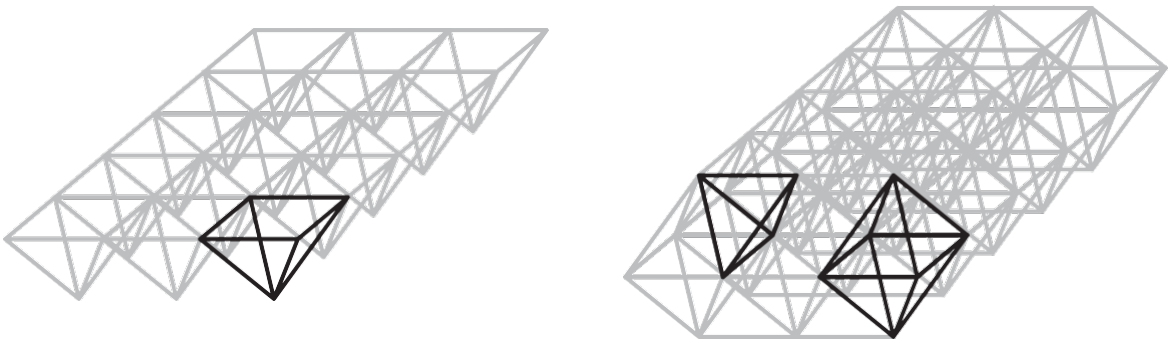
1. Outline all of the triangles you see in the shed roof truss at the right using different colors.
   a. How many different kinds of triangles make up its construction?

   b. What kinds of triangles do you see?

2. Trusses are not limited to a two-dimensional plane. Entire structures can be made from trusses. Study the examples of space trusses shown below.

a. How could a space truss be useful?

b. Why might a space truss be used instead of a solid structure in an application?



3. What geometrical shapes do you see in the space trusses above?

4.

a. What types of structures require extra support?

b. What geometrical shapes are often seen in these structures?

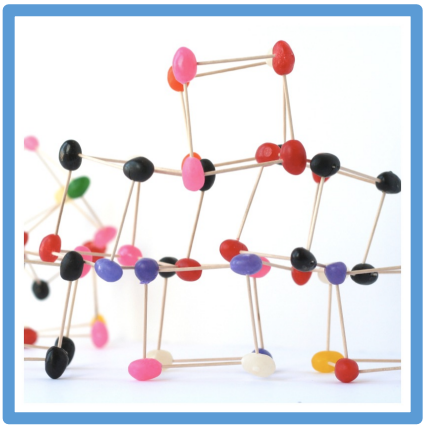
5. Why are triangles often used in the construction of structures?

6. What is an application in which you would use a space truss instead of a solid structure? Explain your reasoning.

Now, you will build a space truss of your own in the…

TOOTHPICK SPACE TRUSS CHALLENGE

Your challenge: Using 20 toothpicks and 10 gumdrops/dots to design a structure that can hold the weight of a large textbook.



Step 1: Before you begin, use this space to sketch out some ideas. Think about framed buildings you see on construction sites. What shapes do you see? Think about bridges, high rise buildings, etc.

Step 2: Build a structure. Sketch the structure here. Take measurements of your structure and label them in your sketch:

Step 3: Test your structure. Pick a really heavy book. Did it hold up well under testing? If so, why was the design successful? If not, what will you try on your next attempt?

Step 4: Try at least two other designs and analyze the success or failure of each one. Sketch your designs here.

Step 5: What is the *tallest* structure you can build?